

**EXAMPLES OF CORAL REEF GROUNDING INCIDENTS<sup>1</sup>****Australia:**

These groundings have occurred on coral during the last 10 years:

Date	Vessel Name	Vessel Type/Size	Grounding Site	Cause/Remarks
Jul 12, 1997	Dakshinesshwar	Sg	Torres Strait (Hood Bank)	
Jul 18, 1996	Peacock	Pa	Piper Reef	
Mar 9, 1995	Carola	Ge	South Ledge Reef	
Oct 4, 1991	Tnt Carpentaria	Au	Sunk Reef	
Sep 9, 1991	Jovian Loop	Pa	Unison Reef	

*Contact: Fiona Thorburn  
Research Officer  
Navigational Services Policy & Planning  
Australian Maritime Safety Authority  
GPO Box 2181, Canberra City ACT 2601  
Tel: 02 6279 5989 Fax:02 6279 5002*

**Cuba:**

Coral reef grounding incidents which occurred in Cuban waters during the last 10 years

Date	Vessel Name	Vessel Type/Size	Grounding Site	Cause/Remarks
Sep 29, 1990	Ferrocemento 279	Cuban Fishing Boat	Quebrado de Roncadora, Colorados Reef	Sank after grounding
Feb 8, 1991	5 de Septiembre	Cuban Tug	Near Peredon Grande Key	Ran aground while anchored with barge
Apr 2, 1991	Aguají	Cuban F/V 17.53m	Lat 22°36'30'' N Long 78°37'20'' W	Negligence
Apr 18, 1991	Ferrocemento No. 107	Cuban Fish Boat/ 12.9m	4 M East Paredon Grande Key	Negligence
Jun 11, 1991	Cayo Largo No. 33	Cuban Fish Boat 18.03m	West Cabezo de la Estopa Reef	Sank after grounding

<sup>1</sup> All tables contain all information received as of June 18, 1999.

Date	Vessel Name	Vessel Type/Size	Grounding Site	Cause/Remarks
Sep 24, 1991	Ferrocemento No. 14	Cuban Fishing Boat/ 12.9 m	Colorados Reef	Sank after grounding
Dec 28, 1991	Patana PC-50	Cuban Barge 28.5m	De la Aguada Inlet	While towed left tow cable, ran aground and sank
Apr 26, 1992	Lambda 309	Cuban Fishing Boat 20.8m	Quebrado de Ines de Soto, Colorados Reef Lat 22°47.5' N Long 83°53.8' W	
May 11, 1992	Lambda 310	Cuban Fishing Boat 23.2m	Sancho Pardo Bank Lat 22°10.4' N Long 84°43.8' W	
Mar 13, 1994	FC-199	Cuban F/V 16.16m	Tanamo Bay Entrance Channel Reef	
Feb 25, 1996	Agnes	Honduras Freighter 32.56m	Mulas Point Reef Lat 21°03' N Long 75°34' W	Grounding while vessel was adrift and sank
May 1, 1996	Alba Sierra	Cyprus Freighter 144m	Fustete Reef, Guacanbayabo Gulf	
Feb 25, 1996	Areosti	Antigua Freighter 90m	Sancho Pardo Bank	
Jul 5, 1996	Unidad Plataforma 34	Cuban F/Vat 17.3m	Near Bahia de Cadiz Lighthouse	Sank after grounding
Jul 7, 1996	Mappeleine	Honduras Freighter 57m	Near Verde Key	Navigation error
Nov 28, 1996	Polarco 5	Cuban Tug	East Cayo Moa Grande Key	Ran aground with 2 barges
Jan 25, 1997	Rayo	Cuban Pleasure Boat 4.45m	Los Ballenatos Reef	Bat weather conditions
Sep7, 1997	Spyros	Panama Freighter 105.67m	Cabezo Sambo Bank, Los Canarreos Archipelago Lat 21°28.17' N Long 82°12.58' W	Negligence/Sank after grounding with 19 t of fuel and oil and 3092 t of cement

Date	Vessel Name	Vessel Type/Size	Grounding Site	Cause/Remarks
Dec 3, 1997	Blue Skies	UK Recreation Boat 11.8m	Los Ballenatos Reef	Sank after grounding
Feb 11, 1998	Arco Iris	Spain Sailboat 8.36m	Los Colorados Reef Lat 22°22'25''N Long 84°29'27''W	Bat weather conditions/Sank after grounding
Feb 4, 1998	Sea Star	Panama Freighter 52.8m	SW Verde Key, Old bahamas Channel Lat 22°05'15''N Long 77°37'24''W	Problems with engine
Nov 5, 1998	Wiki Wiki	Belgian Recreation Boat 10.5m	Near Las Coloradas Lighthouse, East Cienfuegos Bay Entrance	Sank after grounding

*Contact: Mr. Rolando Feitó Sarduy*  
*Director Nautical Charting Agency (EDIMAR)*  
*GEOCUBA*  
*Miramar, Playa, LaHabana Cuba*  
*Tel: 53 7 23 3092 Fax: 53 7 24 2869*

#### **Mexico:**

Year	Vessel	Vessel Size/Type	Grounding Site	Cause/Remarks
Dec 17, 1997	Leeward	67m Cargo vessel	Grounded at "Cuevones Reef" in the National Marine Park "Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc", Mexican Caribbean. Leeward The damaged area was about 560 square meters.	The cause of the incident was determined to be "ignorance of the marine bottom". The economic evaluation performed upon request from the Mexican Government determined the cost of the accident at U.S.\$1.4 million. The parameters used in the economic evaluation included costs of restoration, monitor-ing, loss of the opportunity to use the reef, and the establishment of actions to prevent this kind of incidents.

*Contact: Mr. Gerardo Garcia Beltran*  
*Assistant Director of Investigations*  
*Marine National Park*  
*E: mail: [parquena@grool.telmex.net.mx](mailto:parquena@grool.telmex.net.mx)*

**Netherlands (Antilles):**

Year	Vessel	Vessel Size/Type	Grounding Site	Cause/Remarks
Jun 20, 1995	Infiniti	67m Cargo vessel	Grounding at Lat12-02N/ Long68-47W (near Hambrak in Curacao); Described in "Marine Pollution Bulletin, Vol 30, p631.; Physical damage to 5100m <sup>2</sup> of which about half was totally destroyed by scouring.	Drifted aground. Could not be freed by two tugs. 400 tons of cargo (rice) was jettisoned which caused "smothering of large reef area.
Jul 20, 1998	TLP Ursa + Balder	Drilling Platform (Shell) together w/ anchoring vessel.	2700 m <sup>2</sup> light to total destruction of coral due to dragging of anchor cables over the seabed (extremely well developed) Lat12-04-30'N/Long68-52W Caracas Bay, Curacao	Platform was anchored for maintenance, but in an erroneous way. This caused the cables to drag over the nearby coral reef. Destroyed one of the finest scuba diving locations of the island. Diving tourism is one of the best growing potentials in the tourist sector. Although no funds were recovered, the estimated loss is 1- \$2.5mm
Dec 15, 1998	Monarch of Seas	Giant Passenger Cruise vessel	Historic Reef and diving attraction Proselyte Reef, St. Maarten, 17-59N/ 63-03W. ; Damage this time consisted of 5 areas with a total of 127 m <sup>2</sup>	Ran aground on the Reef by navigational error. (Several vessels ran aground before)
General		tankers	General anchoring damage on Sababank and coast of St. Eustatius (Statia) Damage not quantified. Both areas contain much coral, sea grasses and soft coral. ; Additional disadvantage is said to be that local fisherman (lobster and queen conch <i>Strombus gigas</i> ) are hindered in their work.	Many tankers prefer to anchor in these areas awaiting a berth, or for other reasons.  Governments were asked to designate specific anchorage areas but not action has been taken.

Contact: Dr. A.O. Debrot  
Carmabi Foundation  
P.O. Box 2090, Curacao  
E-mail: [carmabi@ibm.net](mailto:carmabi@ibm.net)

**United States:**

Year	Vessel	Vessel Size/Type	Grounding Site	Cause/Remarks
1996	Igloo Moon	480-ft German tanker	Grounded causing 2600 sq. meters of damage to Patch Reef in Key Biscayne	Attributable to navigation errors.
1996	Allie B	110-ft tug, pulling a 354-ft barge	Grounding in the Biscayne National Park	Opened a trench 3/4 mi. long, up to 48 ft wide, and 9 ft deep thru the coral reef. Cause: navigation errors.
1997	Fortuna Reef	Merchant vessel	Grounded off Mona Island, Puerto Rico.	Destroyed 6.8 acres of fringing coral reef. The recovered restoration funds from the vessel amounted to U.S. \$1, 050,000
1993	Jin Shiang Fa	37-meter fishing vessel	Grounded in the southwestern portion of the remote and pristine atoll at Rose Island, American Samoa	Spilled 100,000 gals of diesel fuel, 2,500 lbs of ammonia and 500 gals of lube oil. In addition to physical damage to the southwestern reef, biological damage included mortality of reef organisms near the wreck, including the coral line algae which is now overtopped by other fleshy algae.

*From multiple sources.*

In the Hawaiian Islands between 1993 and 1997, the U.S. Coast Guard received 49 reports of commercial ship groundings, involving 31 commercial passenger boats (63%); 13 fishing boats (25%); 2 freighters (4%); 1 towboat (2%); 1 industrial vessel (2%); 1 offshore supply vessel (2%). In that same period, 17 commercial ships sank (10 fishing boats, 6 passenger boats, 1 towboat).

*Source: "Hawaii's State of the Reefs:"*

*by Athline M. Clark and Dave Gulko*

*Department of Land and Natural Resources*

*Hawaii, USA*

## **EXAMPLES OF ANCHORING AND CABLE DAMAGE TO CORAL REEFS**

### **Mexico:**

<b>Year</b>	<b>Vessel</b>	<b>Vessel Size/Type</b>	<b>Anchoring Site</b>	<b>Cause/Remarks</b>
1997	Leeward	158.88 m Northway Cruise Line	Arrecife de Cuevones, inside the Marine National Park, Isla Mujeres, Cancun	damaged 10% of the total area or 462 square meters; U.S.\$1million in compensation
1997	Mr. Boss	46 ft	Reef Chitales, National Marine Park, Cancun	damaged an area approx. 410m X5m
1998	E Aho Laula	40 ft.	Contoy National Park, Reef Cabezo, Cancun	not much environmental damage
1998	Mayan Princess	30 ft	Marine National Park, Punta Cancun, Cancun	Site does not have many corals

*Contact: Mr. Gerardo Garcia Beltran  
Assistant Director of Investigations  
Marine National Park  
E: mail: [parquena@groo1.telmex.net.mx](mailto:parquena@groo1.telmex.net.mx)*

### **United States**

Incidents of anchoring or cable dragging at the Flower Garden Banks, as witnessed by researchers and sanctuary management or reported by sanctuary users.

<b>Year</b>	<b>Vessel</b>	<b>Vessel Size/Type</b>	<b>Anchoring Site</b>	<b>Cause/Remarks</b>
1978	-	Liberian Tanker	0.5 mi from reef crest	-
1978	Texaco Florida	Tanker	0.4 mi from reef crest (27-30 m)	-
1978	Rachel Sanchez	Liberian Tanker	On nodule terrace	Left within 45 min. of contact
1979	Venture Texas	Liberian Tanker	East FG Bank	Destroyed monitoring site marker buoy.
1979	Ogden Champion	U.S. Tanker	East FG Bank	Very near monitoring site
1980	William Lamar Mellon	Tanker	Did not anchor	Intended to anchor within 100 m of research vessel; left after contacted.
1983	Nick Candies	Tug and Tow Barge	East FG Bank (24-30 m)	Reef damage by apparent dragging and bouncing of anchor as it was hauled in. Also chain, and cable damage.

1992 Flower Garden Banks National Marine Sanctuary Designation				
1994	-	Panamanian Tanker	Did not anchor	Intended to anchor within 100 m of research vessel-- left after contacted. Reef or protected area not indicated on chart
1994	Mana	Panamanian Freighter	West FG Bank nodule terrace	Anchored on reef -reef or mpa not indicated on chart
1995	Mary S	Commercial Fishing Vessel	East FG Bank northern reef	Anchoring damage to coral and sponges
1996	DE YUE	Chinese Tug	West FG Bank nodule terrace	Unauthorized anchoring observed – too deep to assess damage by scuba dive.
1997-1998	-	Tug and Barge	West FG Bank	Damage to reef from two incidents of towing cable drag – no witnesses

#### Legislative actions to address coral anchoring concerns

1. Since 1978, anchoring has been recognized as a significant problem and considerable threat to an area off the coast of the State of Texas called the Flower Garden Banks. In most of the documented cases actual anchoring has been observed or an intent to anchor has been clearly exhibited. In 1992, with the designation of the Flower Garden Banks National Marine Sanctuary, vessels larger than 100 feet in length were prohibited from anchoring on the banks. This measure was aimed at protecting the reef from major impacting factors: anchoring by oil field service vessels, tow boats and barges, tankers, and freighters. Vessels less than 100 feet in length were required to use mooring buoys, if available. If none were available, such vessels could anchor, but could not damage sanctuary resources and were required to use ground tackle with no more than 15 feet of chain or wire rope.

NOAA added information about the sanctuary and its regulations to nautical charts soon after designation. Incidents that have occurred since designation have involved foreign flagged merchant ships.

At least one extensive area of damage by a large vessel anchoring on the shoalest portion of the West Flower Garden Bank in the last two decades indicates the seriousness and the durability of anchor damages. It measures approximately 50 m in diameter, has very low relief, and hundreds of abraded, fractured, and toppled coral colonies. Chain scars, which are still evident on many corals, probably resulted from a large vessel that anchored on the top of the bank and swung on anchor over several days time. As this incident was not reported by sport divers, it probably occurred prior to the increased levels of charter boat visitation that occurred in the mid to late 1980's. The destruction is still visible more than 10 years later.

*Contact: Dr. Steve Gittings,  
NOAA, National Ocean Service Silver Spring, Maryland USA  
Tel: (301) 713-3125, ext. 130*

Incidents of anchoring or cable dragging at or adjacent to the Florida Keys National Marine Sanctuary, as witnessed by researchers and sanctuary management or reported by sanctuary users.

DATE	VESSEL NAME	Size	ANCHOR DGPS Coords.	Habitat	DEPTH	IMPACT AREA = MIN SIZE AREA
<b>1997</b>						
8/31/97	<i>FINIX</i>			TORTUGAS BANKS CORAL REEF	39'	injury not found
9/30/97 THRU 10/1/97	<i>DESPINA</i>	900+ ?	24° 36.505 83° 05.316	TORTUGAS BANKS CORAL PATCH REEF, edge of reef and over sand	73	not measured, previous anchor damage apparent
9/30/97 THRU 10/1/97	<i>NARVA</i>	?	24° 37.846 83° 05.478	TORTUGAS BANKS CORAL PATCH, low profile reef	59	injury found and video'd; not measured
9/30/97 THRU 10/1/97	<i>MILAGRO</i>	?	24° 38.705 83° 04.671	TORTUGAS BANKS CORAL, RELIC SPUR & GROOVE formations	51	injury found and video'd; not measured
9/30/97 THRU 10/1/97	<i>LIKA</i>	852 ft. 259.8m	BOW: 24° 39.73/83° 05.22 ANCHOR: 24° 39.67/83° 05.24	TORTUGAS BANKS CORAL PATCH	70'	> 400,000 sq m (all coral cover)
<b>1998</b>						
4/4/98	<i>DIMITRIOS</i> 4/4/98		24° 40.65 83° 05.75	TORTUGAS BANKS CORAL REEF, relic spur and groove	68 - 170	> 2712.3 sq m
??	OLD FREIGHTER DAMAGE		24° 39.416 83° 05.018	not dived		not dived
6/20/98 THRU 6/21/98	<i>PACIFICATOR</i>		24° 36.40 83° 03.68	TORTUGAS BANKS SAND BOTTOM	68	injury not found
6/20/98 THRU 6/21/98	FISH TRAP'G		24° 37.25/75? 83° 04.80	TORTUGAS BANKS CORAL PATCH	45	
6/3/98 THRU 6/16/98	<i>EUROPEAN</i>	300- 400'	BOW: 24° 26.52/82° 36.34 ANCHOR: 24° 26.49/82° 36.36	REBECCA SHOAL pass 9.5 miles South of Rebecca Shoal Light CORAL PATCH REEF	BOW: 65 ANCHOR: 71	> 2500 sq m
<b>1999</b>						
9/23/99	two FREIGHTERS observed		N/A	REBECCA SHOAL pass (approx. same as above)		



10/11/99	<i>IBN AL</i>	175 m	24° 27.2	0.6 nm off KW SHIP	not dived inclement
10/12/99	<i>ROOMI</i>		81° 47.6	CHANNEL buoy w/in	weather
				Key West Anchorage;	
				unknown bottom type	
10/21/99	N/A		24° 26.707	East of RILEY'S	not dived inclement
			82° 56.336	HUMP, > 9 nm East	weather
				unknown bottom type	
11/3/99	N/A		24° 30.07	82° South of DTNP	60-90' ? not dived inclement
			56.00	boundary & > 9 nm	weather
				East of RILEY'S	
				HUMP; unknown	
				bottom type	

2. The region within the Florida Keys National Marine Sanctuary (FKNMS or Sanctuary) known as Tortugas Bank has traditionally been an anchoring area for large, foreign flag vessels holding up and waiting orders to enter a port within the region. However, personnel from the adjacent Dry Tortugas National Park have noticed that recently vessels have begun to anchor on the Bank itself.

On August 30, 1997, FKNMS staff received a video from a recreational diver charter captain documenting anchoring damage caused by a large, foreign-flagged vessel anchored within state waters and the Sanctuary on the Tortugas Bank. Shortly thereafter, Sanctuary biologists visited the reported anchoring site to conduct a biological assessment of the injury to the living coral reef. When they arrived on Tortugas Bank, there were four foreign ships ranging from over 400 to 800 feet in length anchored on the 60 foot deep coral reef bank. Although staff was unable to locate the original site that was reported in the video, they were able to assess and photo-document the reef damage caused by the four vessels. Staff noted significant damage to corals, sponges, and other delicate coral reef organisms. Wide swaths of barren seabed and overturned coral heads were evidence of the ongoing disruption to the coral reef community caused by the ships' anchors and anchor chains. Effective October 17, 1997, NOAA issued a temporary rule prohibiting the anchoring by vessels 50 meters or greater in length on Tortugas Bank west of the Tortugas National Park within the Sanctuary.

In August, 1998, a permanent ruling went into effect for an area approximately 39.53 square nautical miles, prohibiting anchoring by vessels 50 meters or greater in registered length. NOAA has identified and recommended alternative anchor sites within approximately two nautical miles of the prohibited area. Vessels greater than 50 meters in registered length are already prohibited by the 1990 Florida Keys National Marine Sanctuary and Protection Act from operating in certain other areas of the Sanctuary, referred to as "Areas to be Avoided".

*Contact: Mr. Billy Causey,  
NOAA, National Ocean Service  
Superintendent, Florida Keys National Marine Sanctuary  
Tel: (305) 743-2437*

## **EXAMPLES OF ECONOMIC COST OF GROUNDINGS**

### **United States:**

In the last two years, over 1000 vessel groundings in the Florida Keys National Marine Sanctuary alone (approximately half coral, half seagrass) have resulted in approximately 35 cases forwarded for consideration as natural resource damage actions, resulting so far in the recovery of more than U.S.\$13,000,000.

Significant groundings within the Florida Keys National Marine Sanctuary, 1984 – 1997

<b>Vessel Name</b>	<b>Date and Scope of Injury</b>	<b>Location</b>	<b>Vessel Size</b>	<b>Cause of Grounding/Remarks</b>	<b>Funds Recovered</b>
Wellwood	8/4/84 - 1500m; extensive biological and structural damage	K.Largo NMS (Molasses Reef)	122 m	Operator/ navigation error	\$5,654,228
Mini Laurel	12/11/86 – biological & structural damage	K. Largo NMS (Molasses Reef)	65 m		\$30,000
Alec Own Maitland	10/25/89 – 930m2 partial destruction; 680.5m total destruction	K. Largo NMS (near Carysfort Light)	47 m	Operator/ navigation error	\$1,450,000
Elpis	11/1/89 – 482m partial destruction; 2604.7m total destruction	K. Largo NMS (near Elbow Reef Light)	143 m		\$2,275,000
Jacquelyn L.	7/7/91 – 123.1 m total injury; .5m partial injury	FKNMS (W.Sambo Reef)	54 ft		\$251,554
Miss Beholden	3/13/93 – 1025.6m biological destruction and physical damage	FKNMS (W. Sambo Reef)	45 m	Was taking on water and intentionally grounded to prevent sinking	(\$1,873,741)
Columbus Iselin	8/10/94 – 345m total destruction	FKNMS (Looe Key)	52 m	Operator error	\$3,760,488
Contship Houston	2/2/97 – 7107m of crushed mature reef	FKNMS (Maryland Shoal)	187 m	Ship owners purchased racon beacons for FKNMS	ER/DA cost pd. RP undertaking restoration
Golden Lady	97.4m injury to coral reef crest, 20.7m living coral destroyed, 298m total area	FKNMS (W. Sambo Reef)	71ft		\$54,716

Source: NOAA, Marine Sanctuaries Division

Note: The majority of groundings in the Florida Keys National Marine Sanctuary are generally caused by the inexperience of the boater, operator/navigation error, or negligence.